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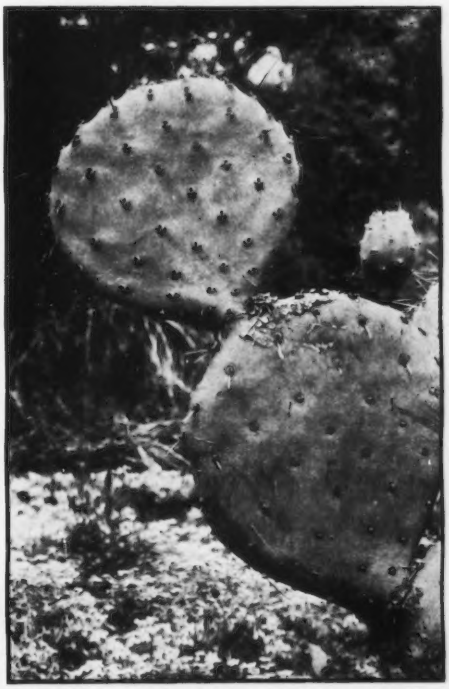
CACTUS AND SUCCULENT JOURNAL

Of the Cactus And Succulent Society Of America

Vol. IX NOVEMBER, 1937 No. 5



Joints of the type plant of *Opuntia flavescens*. The undersized fruit is from the last of the crop.
(See page 67)

CACTUS AND SUCCULENT JOURNAL

Published and Owned by the Cactus and Succulent Society of America, Inc., Box 101, Pasadena, California. A monthly magazine to promote the Society and devoted to Cacti and Succulents for the dissemination of knowledge and the recording of hitherto unpublished data in order that the culture and study of these particular plants may attain the popularity which is justly theirs. Subscription $3.00 per year. Foreign $3.00 per year by international money order. Membership in the Cactus Society free with subscription. Mail application to SCOTT HASELTON, *Editor*, Box 101, Pasadena, Calif. *Editorial Staff*: THE ENTIRE SOCIETY. Entered as Second Class Matter at Pasadena, Calif., under act of March 3, 1879.

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CACTUS AND SUCCULENT SOCIETY TOUR OF NURSERIES

Sunday, November 21.

12:00 Noon. Lunch in picnic grove of Anaheim City Park. Coffee will be provided.

1:00 P. M. Visit Gates Famous Cactus Gardens, 119 S. Illinois St., Anaheim.

3:00 P. M. Visit Johnson Water Gardens, 401 Michigan Ave., (Cherry St.), Hynes.

4:00 P. M. Visit Poindexter Nursery, Temple and Rosecrans, Compton.

In case of wet weather, tour will be postponed to November 28.

MY TEN FAVORITE CACTI AND WHY

The above is a suggested topic for a series of JOURNAL articles that should appeal to our readers throughout the world. The ten plants receiving the highest vote will be illustrated in the JOURNAL. Many plants will, no doubt, receive comment in these columns even though they may not be one of the ten winners. Full credit will be given any material used. This same plan will be repeated with the other succulents and your replies should be sent in at the earliest convenience. Please mail your comments direct to the Editor or to Dr. R. W. Poindexter, 1000 N. Temple, Compton, Calif.

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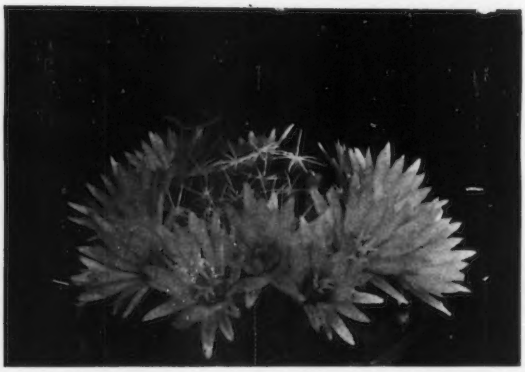

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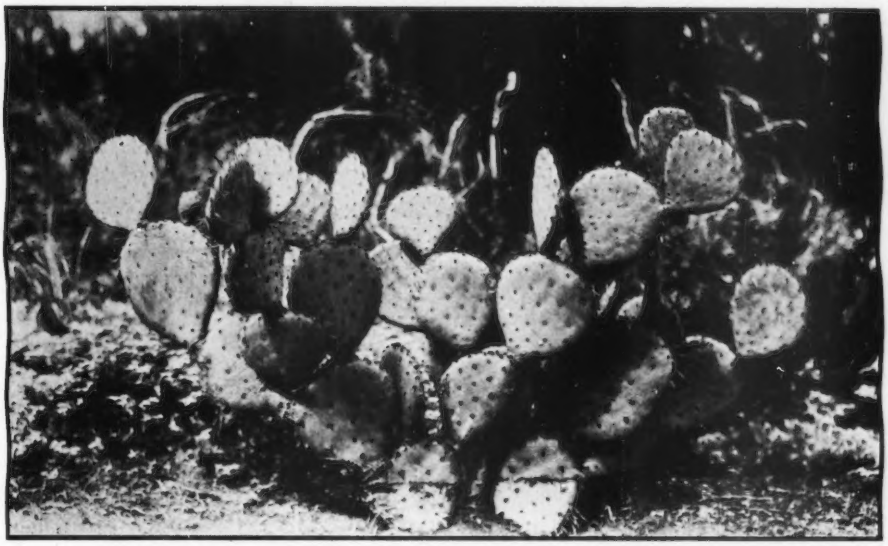
Mamillaria sphaerica

large yellow flower, blooms very long and easily.



The type plant of *Opuntia flavescens*, grown under cultivation, Sacaton, Arizona.

A New Species of Opuntia Series Dillenianae

By R. H. PEEBLES

Opuntia flavescens sp. nov.

Planta acaulescens, ramis adscendentibus; articulis glaucis orbiculato-obovatis basi constrictis; pulvillis oblongis parvis remotis; aculeis paucis, principalibus in marginibus articulorum plerumque porrectis rectis seu paulum flexis basi fuscis apice subflavis, minoribus brevioribus pallidis deflexis; setis fulvis in articulis vetustis plantarum vetustarum solum conspicuis; floribus flavis; bacca obovata rubra, pulpa succulenta luteolo-viridi; seminibus stramineis compressis, commissura acutissima.

Plant without a distinct trunk, 1 m. high, 1½ m. in diameter, the branches ascending or erect; larger joints 25 cm. long, 18 cm. wide, 2 cm. thick; areoles 3 to 4 mm. long, 3 cm. apart; principal spines 1 to 3, rarely 4, in number, 2 to 3 or rarely 4.5 cm. long, borne on the marginal areoles on the upper half of the joints; accessory spines 1 or 2 in number, borne with the principal spines and also on the upper lateral areoles; fruit "rocellin purple" or "hellebore red" (1); seeds 4.5 mm. wide, irregularly angled.

Type, *A. R. Leding No. SF 66*, near Sells, Pima County, Arizona, Oct. 30, 1925.

The above description is drawn from the type plant, grown at Sacaton, Arizona, for 11 years, and material from the type plant deposited in the U. S. National Herbarium.

Opuntia flavescens is common on the plains in the southeastern part of the Papago Indian Reservation, Pima County. The Papagos distinguish the species by the name *oömeipe*, meaning yellow, in reference to the color of the pulp of the fruit, which is highly esteemed for its palatability. The specific name refers to the same characteristic.

The new species resembles some forms of *Opuntia Lindheimeri* Engelm. more than any Arizona species, and it may be referred to series Dillenianae, according to the key in Britton & Rose (2, p. 45).

The following key has been arranged as an aid in distinguishing the Arizona species related to *Opuntia flavescens*.

Key to Arizona species, series **Dillenianae**

Joints obovate to narrowly obovate, sea-green.
- Plant usually tall and openly branching; joints narrowly obovate, on mature plants mostly spineless ..... *O. laevis*
- Plant not over 1 m. high and more compactly branching; joints often well armed, shorter and relatively broader ..... *O. laevis* var. *canada*

Joints orbicular or orbicular-obovate, gray-green.
- Spines subsetaceous, translucent, mostly strongly deflexed ..... *O. chlorotica*
- Spines stout, scarcely translucent, not strongly deflexed.
  - Areoles up to 6 cm. apart, the glochids usually prominent; spines sometimes dark at base (Lousiana, Texas and Mexico, not Arizona) ..... *O. Lindheimeri*
  - Areoles about 3 cm. apart, the glochids not prominent except at the base of old plants; spines always dark at base (Pima County, Arizona) ..... *O. flavescens*

Although Griffiths (3, p. 90) recognized the close relationship, the combination *Opuntia laevis* Coult. var. *canada* (Griffiths[1]) apparently has not been published heretofore.

Opuntia gilvescens Griffiths, from the foothills of the Santa Rita Mts., Arizona, was considered by Griffiths (3, p. 87-88) to be related to *Opuntia phaeacantha* Engelm., but plants exactly like his photograph (ibid., plate 7), growing in Box Canyon, Santa Rita Mts., are not distinguishable from *Opuntia laevis* except in the low, more compact habit and relatively broad joints.

The joint of *Opuntia procumbens* Engelm. & Bigel. collected by J. M. Bigelow between the San Francisco Mts. and Cactus Pass, Arizona, in 1853, appears to be one of the numerous variants of *Opuntia phaeacantha* Engelm. For the time being, difficulty could be avoided if *O. procumbens* were relegated to the category of doubtful species.

The remaining Arizona species assigned to the Dillenianae by Britton & Rose is the common *Opuntia chlorotica* Engelm. & Bigel. The densely branched, compact plants found in the foothills and on the plains, e.g., in the vicinity of Wickenburg, are quite distinct in habit from the plants of lax growth seen in the mountains, but the two forms seem to be alike in other respects.

[1] *Opuntia cañada* Griffiths, Ann. Rep. Mo. Bot. Gard. 20:90. 1909.

CITATIONS

(1) Ridgway, R., Color Standards and Color Nomenclature. 1912.
(2) Britton, N. L., and J. N. Rose, The Cactaceae I. 1919.
(3) Griffiths, D., Ann. Rep. Mo. Bot. Gard. 1909.

R. H. PEEBLES, Sacaton, Arizona,
April 12, 1937.

Botanical Exploration in South Africa

(Continued from Vol. VIII, No. 12)

By R. A. DYER

My narrative in the June CACTUS JOURNAL brought us as far as Stegi on the border of Swaziland and Portuguese East Africa. Stegi, as Mr. Reynolds humorously expressed it, is a grand little place with all modern inconveniences. For one thing, on account of the absence of adequate lighting facilities we were unable to pack our booty after dinner to facilitate an early start next morning. Consequently on the following morning our first job was to pack all our specimens, duly labelled and numbered, and consign them to headquarters. This duty can be a real burden after a stiff day in the field, but it must be done conscientiously otherwise the scientific value of the excursion is seriously impaired.

Only a few miles out of Stegi we called in to visit correspondents whom we had not previously met, namely Mr. and Mrs. D. R. Keith. Mr. and Mrs. Keith, after whom I named and recently described a new species of *Caralluma* in FLOWERING PLANTS OF SOUTH AFRICA, have built a most attractive rockery on one side of their entrance drive. There we saw many rarities, a few of which were then in flower, including *Aloe chaubaudii* and a new species in the "maculate" group of Aloes and several species of *Euphorbia* and *Crassula*. Mr. Keith's enthusiasm would have kept us indefinitely, but we had to push on. We did not part, however, before he had accompanied us several miles along our road to discover for us a rich hunting ground

Pongola River

for *Caralluma ubomboensis*. This charming little species was described by our companion, Miss Verdoorn, in FLOWERING PLANTS OF SOUTH AFRICA in 1932 and it had not been reported again until Mr. Keith's recent discovery. His locality was a considerable distance further north than the type locality, but on the same series of mountains. The plants thrive in this habitat with a liberal water supply most of the year, either from rain or mists, and it would surprise many people to know how general succulents are in the crevices of rocky outcrops on temperate alpine-like mountain ridges throughout South Africa. *Huernia whitesloaneana* is another example which favours these conditions.

We hadn't said aurevoir to Mr. Keith long when we began to pass "maculate" Aloes in plenty and at a favourable opportunity we made a halt for Mr. Reynolds to take photographs, make notes and collect good specimens. Our interest was further aroused by the fact that the primitive natives (we were now many miles from civilization) had used some of the Aloes to adorn a native chief's grave—at least this was our conclusion judging by the typical mounds of stone and relics of a previous settlement or "kraal." The importance of a few perplexing features noticed among the Aloes, such as variations in leaf marking, length of raceme, size and shape of flowers has yet to be determined. Suffice it to say that the botanist who stays at home rarely gets more than a very imperfect impression of the whole truth. His peace of mind, however, is probably the more secure on this account.

In a small wood on the eastern side of the mountain near the site of the chief's grave, tree Euphorbias were seen in plenty, among them, *E. evansii, E. tirucalli* and another species which may well prove to be a form of *E. triangularis*. On the margin of this wood or low forest a semi-succulent deciduous shrub, *Ibosa* sp. was covered with a mass of minute pink flowers making a beautiful sight. It is one of the rare members of *Labiatae* or "mint" family. Some cuttings from these plants are flourishing in Pretoria and it is anticipated that its horticultural merits will soon be generally appreciated.

Aloe sessiliflora and *A. marlothii* were noted on the ridges and slopes and one particularly handsome hybrid between these two species was outstanding.

With regard to the tree Euphorbias mentioned above, it is interesting to note that they are invariably associated with scrub or brush under natural conditions and it is obvious that they require a certain amount of protection. In some areas they are tolerant of high rainfall at intervals, while in others the rainfall is usually com-

Aloe pongolensis about 6 miles west of Gollel, Swaziland

paratively low. *E. triangularis* and *E. grandidens* are also associated in river-bank bush along the coast of the eastern Cape Province. In some sites their roots are permanently in contact with saline water and yet their growth is not abnormally robust. It may well be suggested that the salinity of the water prevents undue absorption by the roots—in fact it may be interpreted as a physiological drought.

To return to our journey, we were now definitely in the wilds, on a private road constructed by a native recruiting corporation to enable natives to be transported to the gold mine near Johannesburg. Succulents were apparently scarce on the wooded and grassy slopes of the great Usutu valley. We descended steeply to the river by a winding road through fine scenery to the river (see map published with previous article) where "maculate" Aloes again showed up in quantity.

The Usutu River is broad and the only means of crossing it in this area is by a pont driven by native power. Natives are always in attendance for this purpose and after preliminary formalities, including the payment of a fee of 5s, we had a troupe of men and women and children in various stages of undress. By dint of long experience their leader selected a tortuous channel not more than four feet deep. What at first sight appeared to hold out prospects of adventure was passing off serenely until one of the older men floundered into a deep hole and was narrowly saved from drowning. Unfortunately the light had failed and it was not possible to take a photo of our retinue and the accompanying photo was taken on the following day when we crossed the Pongola river in a more stately manner. Night fell before we reached shelter; Aloes there were in plenty including hosts of the stately *A. marlothii,* but we paid little heed to them. In the light of the motor car head lamps appeared occasional buck and hares, but fortunately no lions. A sharp dip in the bumpy road and the main blade in the back spring broke. We limped on through the little settlement of Ingwavuma where accomodation was unobtainable and eventually to Gollel. On the flats approaching Gollel we drove through literally millions of *Aloe pongolensis* (described by Mr. Reynolds) and the photo shown was taken in this place on the following morning. More news of them anon.

(LEFT TO RIGHT) Top row: *Ariocarpus retusus, A. elongatus, A. furfuraceus.* Center row: *A. fissuratus, A. trigonus, A. lloydii.* Bottom row: *A. strobiliformis, A. mcdowellii, A. scaphorostrus, A. kotschoubeyanus.*

ARIOCARPUS

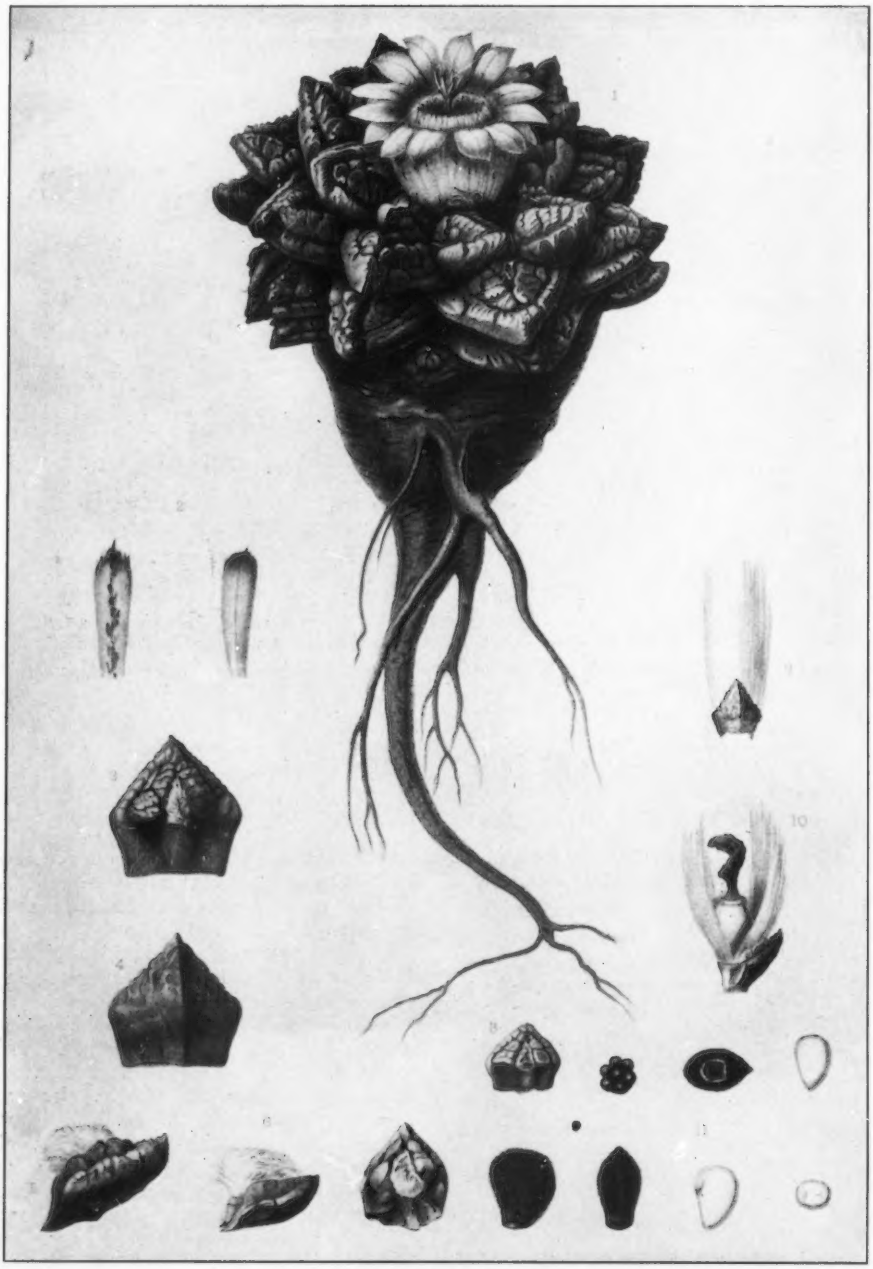
By MARJORIE H. LEE

The genus *Ariocarpus* belongs to the subtribe Echinocactanae of the tribe Cereeae of the Cactus family and is, so far as is known, composed of the following ten species:

1. *A. fissuratus*
2. *A. lloydii*
3. *A. kotschoubeyanus*
4. *A. mcdowellii*
5. *A. retusus*
6. *A. furfuraceus*
7. *A. trigonus*
8. *A. elongatus*
9. *A. scaphorostrus*
10. *A. strobiliformis*

The type species is *A. retusus* which was described by Scheidweiler who erected the genus in 1838. The word *Ariocarpus* comes from the genus *Aria* and the Greek word *"carpus,"* a fruit referring to the Aria-like fruit. The genus was at one time known as *Anhalonium,* which was discarded because of the priority of Scheidweiler's *Ariocarpus.* The genus occurs in northern Mexico and thus far only one species, *A. fissuratus,* is found in the United States, in southern Texas.

According to Berger's classification this genus should properly be divided into three genera: *Roseocactus,* including numbers one to four; *Ariocarpus,* nos. 5 to 9 inclusive and *Encephalocarpus,* having only the one species, *A. strobiliformis.* In 1850, Salm-Dyck described *A. elongatus,* sometimes confused with *A. trigonus* or *A. scaphorostrus,* as all three have three-cornered tubercles. Some authorities are even of the opinion that it may be a variety of *A. furfuraceus,* as both of these plants are found growing in the same general locality. *A. elongatus* has longer and greener tubercles and the flower has a more pronounced pink mid-rib than *A. furfuraceus. A. mcdowellii* is considered to be a separate species from *A. kotschoubeyanus,* although it has been classified as a variation of the latter.



P. ROETTER DEL. MAMILLARIA FISSURATA PICART SC.

1, a flowering plant; 2, petals: 3-9 tubercles of different size and age and in different positions; 3, a large tubercle from above; 4, same from below; 5, same from the side; 6, a smaller one, with fewer divisions from above; 7, side view of same; 8, a small tubercle from above; 9, a young one, with the silky wool yet (65) straight and smooth; 10, a young tubercle bearing a fruit, which becomes visible after separating the wool; 11, seed.

The first four in Berger's sub-genus, which is Backeberg's genus *Roseocactus* have short, broad, triangular and roughened tubercles with a wool filled groove extending from the apex of the tubercle inward; in other words, the tubercles are parted by a sharp, deep line or cleft. The flowers are relatively small, usually pink or purple, although *A. fissuratus* has at times such pale pink flowers that they appear to be practically white.

The second group of five plants in Berger's sub-genus, which is Backeberg's genus *Ariocarpus* have large flowers. *A. trigonus* has a yellow flower and *A. scaphorostrus,* reddish purple. The others in this group are white. These plants have the tubercles as a unit without clefts and the tubercles are smooth, more elongated, and with a small but generally visible areole near the tip of each tubercle.

Ariocarpus strobiliformis is distinctly different in its characteristics from either of the other two groups. The flower is of medium size and light purple.

The plants of this genus are generally described as usually simple, low with a round or flat top, spineless; tubercles tough, horny or cartilaginous, triangular, imbricated, spirally arranged in a somewhat rosette form; areoles terminal or at the bottom of a groove near the middle of the tubercle; flowers appearing from near the center of the plant on young tubercles, diurnal; fruit oblong, smooth; seeds black, tuberculately roughened, with a large basal hilum. Several members very closely resemble certain small *Aloes* and *Haworthias.*

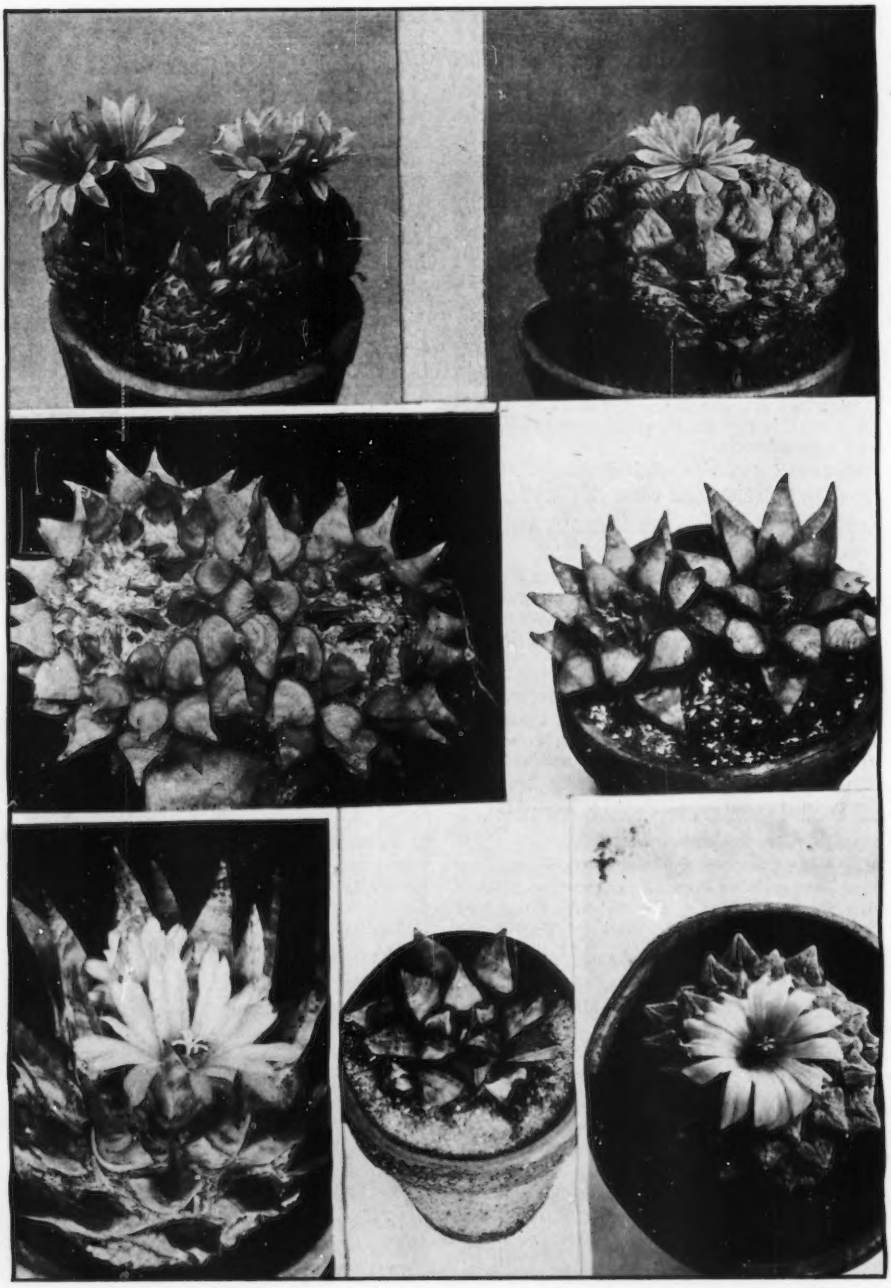
The plants are in the truest sense mimicry plants inasmuch as they are without exception amost the exact color of the soil and the gravel in which they are found growing. The search for these plants is usually a very difficult one. In the dry season, they are found rather deeply pulled downward into the soil, frequently covered by dry grasses. Because of their large carrot-like roots which serve as reservoirs, they require very little water and are thus able to stand very prolonged periods of drouth. The plants grow very slowly and full sized specimens are doubtless many years of age. They are found growing in varied soils, frequently very heavy and mixed with clay, sometimes chalky or limestone.

The genus is usually considered as being most closely related to *Mammillaria* under which genus two of the species have been placed. Engelmann, who was greatly puzzled over the group, first considered it as *Mammillaria,* then as a subgenus of *Mammillaria,* and later as a distinct genus. The fruits of *Ariocarpus retusus* and *A. furfuraceus* are very similar to those of certain hooked spined Mammillarias, especially *Mammillaria zephyranthoides.* However, the fruits of all the *Ariocarpus* are deeply imbedded in the silky wool and are consequently well protected. The seed apparently is germinative for a very long time, probably longer than any other cactus seed. New plants are frequently found growing imbedded in the dead plant bodies where the seed had probably remained for several years until the parent plant had become decayed and partially disintegrated.

The following is a general description of the individual plants.

A. fissuratus, possibly the most common of all the *Ariocarpus,* is the well known "living rock" and like the other members of this genus is one of the great curiosities of the cactus family. In appearance it might best be described as a plant carved from rock in a most unique and intricate fashion. It is the only species native in the United States, along the Rio Grande River westward into the Big Bend District and extending southward into Northern Mexico. It grows in dry stoney ground where rain seldom falls, and when not in bloom is easily mistaken for the rocks which surround it. The stems are low, extending only about an inch above the surface of the ground. The large succulent root resembles the common carrot. The stem is dark gray-green in color, spineless, with rough, triangle-shaped tubercles. The flowers are about one and a half inches in diameter and appear in the center of the flat top of the stem. They appear singly or in twos or fours, whitish pink or even purple, crowded together. The fruit is small, oval and pale green. The plant is of medium size, rarely ever being more than five to six inches in width. The plant likes a dry chalky, loose gravely soil.

A. lloydii is, in mature plants, very different from *A. fissuratus,* but in younger plants there is quite a similarity in their appearance. *A. lloydii* grows to two or three times the size attained by *A. fissuratus* and is much more inclined to be caespitose. This plant has been found in clusters over thirty inches in diameter and a foot high, each head being over five inches. The tips of the tubercles of *A. lloydii* point upward and inward while those of *A. fissuratus* point almost directly away from the center. In



(LEFT TO RIGHT) Top row: *Ariocarpus strobiliformis, A. lloydii.* Center row: *A. furfuraceus, A. elongatus.* Bottom row: *A. trigonus, A. retusus, A. kotschoubeyanus.*

the older plants, the more marked is the difference between *A. lloydii* and *A. fissuratus*. The flower is white.

A. kotschoubeyanus is rather small, grayish-brown to green in color. It is a flat little plant not more than one to three inches in diameter, of which only the flat crown shows above the surface of the ground. The thick fleshy body or trunk is, as with the other species of this genus, buried deep in the soil. In this case the tubercles are small, flat, also triangular with grooves in the center reaching almost to the tip. The groove or furrow is filled with a soft velvet-like wool. The delicate pink or light carmine flowers with their wide spread petals arise from the center of the plant and from the axils of the young tubercles. It is interesting fact that the sum of $200.00 was paid for the first plant of this species introduced into Europe in the year 1840, which is several times its weight in gold. The popular name for this plant is the "Deer-foot" cactus owing to the cleft tubercles which resemble a deer hoof.

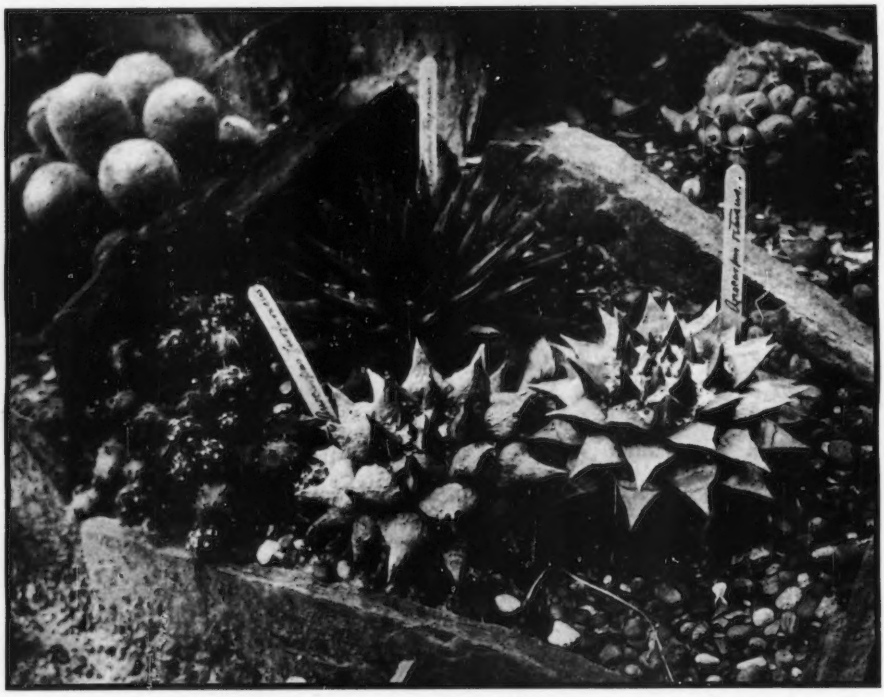
A. mcdowellii is the smallest member of the genus and it is very similar to *A. kotschoubeyanus*. Some authorities are of the opinion that it is a form of *A. kotschoubeyanus*, the one found near Coahuila and is smaller and slightly different from the form found in Querétaro. I have two plant of *A. macdowellii*, one is a single little head not over an inch or an inch and a half in diameter, possessing a body that completely fills a regular sized two inch pot. In order to accommodate the underground body of this plant it is necessary to put it in a four inch pot. It seems to have the largest root system for its size of any of the *Ariocarpus*. I also have another plant with four heads on a single body, none of which are over ½ inch in diameter, but with the same extremely long root. The main difference I see between the plants *A. mcdowellii* and *A. kotschoubeyanus* is in the shape of the cleft in the tubercle. In *A. kotschoubeyanus* the cleft is soft and woolly and is more in a line, while in *A.mcdowellii* the cleft is hard, has a more metalic or stonelike feel and in most instances completely covers the tubercle. Only in a few of the tubercles does the cleft form a line, or "T" shape. The flower of *A. mcdowellii* is not known to me.

A. retusus belongs to the second group of *Ariocarpus* and has the tubercles as a unit. It is also from Mexico and is in the form of a gray-green to reddish rosette. The plants are from four to five inches in diameter, and slightly wooly in the center. The tubercles are triangular and stand up almost straight, pointed, horny and arranged in a rosette form. They are close to ⅞ or an inch in length, rarely an inch and a half. They are almost flat on the surface with the angled borders making a straight line from the base to the tip. It lacks the chin on the lower border and the areole is microscopic or lacking and when present is located at the very end of the tubercle. This plant is very similar to *A. trigonus* except that the tubercles are shorter and not nearly so pointed. This plant as well as *A. trigonus*, reminds one very much of certain small *Aloes* or *Haworthias*. The flowers are white, or nearly white, pink on the outside, and arise from the axils of the younger tubercles. It is generally found in rocky places, among pebbles, from which sometimes only a portion of the plant and tubercles is visible.

A. furfuraceus is another rare plant of this genus. It is grayish-green in color, with rather bellied tubercles which seem to be slightly squeezed-in just below the tip of the tubercles, as if some one had pinched the tip of the plant. It is similar to *A. retusus*, but the tubercles are not so pointed and seem to bend over and out and I believe as a single plant is the largest and most woolly in the center of all the *Ariocarpus*. It is also more sprawling and not nearly so neat and compact as some of the other members. The flowers are white and large, but shorter and broader than the flower of *A. trigonus*. The tubercles are more or less triangular, horny and as with the other members of this genus arranged in a more or less rosette form. The tubercles have a well defined chin on the lower border of each tubercle. My plant is nearly six inches in diameter.

A. trigonus is also from Old Mexico and has the longest and most pointed tubercles of all the *Ariocarpus*. The plant is of a dark green color. The tubercles are arranged rose-like as is characteristic to this genus. This plant, like *A. retusus*, looks very much like an *Agave* or *Haworthia*. The flower is yellow. The word *"trigonus"* means three ribbed and the tubercles have a distinct three angled surface. The tubercles are quite long in my plant and are from 2½ inches to 3 inches in length.

A. elongatus is a very rare and seldom seen species of this genus. This plant exists in the same locality as *A. furfuraceus* and it may be a variety. To me the plant looks more like a cross between *A. furfuraceus* and *A. retusus*. It is smaller and has the slight bellied tubercles like *A. furfuraceus*, but is not so woolly and the tubercles are more erect as in *A. retusus*. The white flower has more of a pink midrib than that



UPPER CENTER: *A. trigonus.* LOWER CENTER: *A. furfuraceus.* RIGHT CENTER: *A. retusus.*
Photo by W. E. Lowry

of *A. furfuraceus* and the tubercles are longer and greener. Dr. W. E. Lowry, of Laredo, Texas, from whom I purchased this plant, states that he searched eight years to find the second plant and then four days of constant searching to collect thirty plants. I am quite happy that I have one of these plants. It is a very attractive double headed specimen.

A. scaphorostrus is another member of the second group. It is a very curious and not at all attractive little plant. It has a rather dried up, brownish appearance. The tubercles are long and narrow, the ends blunt and varies very little in width from the base to the tip. Dr. Lowry says this plant always appears half dead and the wonderful reddish purple flower is a great surprise.

A. stobiliformis, the last member of the genus *Ariocarpus,* is also from Old Mexico and is a very rare as well as a peculiar plant. Some authors are for taking this plant out of this genus and placing it in a genus by itself and in fact a number of them have placed it under the heading of *Encephalocarpus stobiliformis.* The stems look very much like a pine cone or a pineapple without the topping of leaves. There is a tuft of stiff hairs at the tip of each tubercle. The flower is purple. Strobiliformis means cone-shaped.

The following is a quotation from THE CACTUS AND SUCCULENT JOURNAL of January, 1930: "The accompanying illustration* shows another one of the many new, interesting and rare cacti which have come to us from the Jaumave region in the State of Tamaulipas, Mexico. This cactus was first collected by Viereck and introduced to cultivation in 1927 by German firms. Whether it is yet to be found in American collections, is doubtful. It was first described as an *Ariocarpus,* but Berger, on closer study, found it to have so many divergent characteristics as to require it to be placed in a new monotypic genus *Encephalocarpus* (Gr. fruit-inhead). The name alludes to the position of the fruit, buried in the wool of the top. In *Ariocarpus* it is produced,

*See page 74 this issue, *Ariocarpus strobiliformis.*

like the flowers in the axils of the older tubercles, below the top. In *Roseocactus* (formerly *Ariocarpus*) at the base of the furrows of the tubercles.

"This picture shows the appearance of the plant. The flowers are lavender pink, the outer segments very narrow, fimbriate, green; stamens few, golden yellow, stigma-lobes yellowish-white. The specific name comes from the cone-like aspect given by the closely shingled scaly tubercles. Other cacti from the Llano de Jaumave share this latter characteristic, e.g. *Ariocarpus trigonus* and *Obregonia denegrii*. We recommend this to those of our members who are fortunate possessors of federal permit!"

I would also like to quote another article which appeared in the August, 1935, number of THE CACTUS AND SUCCULENT JOURNAL, written by Dr. W. E. Lowry, Sr., of Laredo, Texas:

"The Cactaceae, Britton and Rose, recognize only three species in the genus *Ariocarpus; A. fissuratus, kotschoubeyanus* and *A. retusus,* and regard *A. furfuraceus* and *A. trigonus* as synonyms of *A. retusus.* This error undoubtedly occurred through a lack of material for study and reliance upon incorrect and incomplete descriptions. The accompanying photograph illustrates the difference better than any verbal description.

"*A. trigonus, A. retusus* and *A. furfuraceus** are alike in the thick carrot-like root, the triangular tubercles and the woolly axils, but are otherwise amply separated by differences in the color of the plant and flower and the size and shape of the tubercles.

"*A. trigonus,* (upper center), is a dark green plant with long slender tubercles which in nature are usually erect or incurved, giving the plant a marked agave-like appearance. The flowers are large and a rich yellow.

"*A. furfuraceus* (lower center) is more similar to *A. retusus,* but differs in the rounded, bellied tubercles and in the usual presence of a small woolly areole about five mm. from the tip of the tubercle and in a well defined chin on the lower border of each tubercle.

"Both *A. furfuraceus* and *A. retusus* are gray-green, glaucous plants and both have large white flowers, broader, but shorter than the flowers of *A. trigonus.*"

The accompanying photographs illustrate these plants more easily than any amount of words ever could as it would be hard for a person having no idea as to their appearance, to visualize them in any large degree of correctness. I have in my possession all ten of these plants and hope that they will bloom and live so that I can study them myself and not know them only from books.

These plants are all more or less rare and the Mexican Government has prohibited their export and the only plants coming into the United States are either grown from seeds, imported by special permission of the Mexican Government or bootlegged across the border.

NOTE: To the genus *Ariocarpus* might well be added *Obregonia denegri* and *Strombocactus disciformis,* including the 4 other species described in that genus, thus uniting 16 plants which share in common the factors of horny tubercles, rosette arrangement, relatively small central flowers from the wool bearing areoles and smooth or nearly smooth fruit almost hidden in wool. (W.T.M.)

I am deeply indebted to Mrs. Caroline Schmoll of Cadereyta, Mexico; Dr. W. E. Lowry, Sr., of Laredo, Texas, THE CACTUS AND SUCCULENT JOURNAL, "Cactus" by Van Laren, Mrs. Helen McCabe of San Diego, California, Mr. Lawson of San Antonio, Texas, Mr. Davis of Oakland, California, and Mr. Clum of Los Angeles. All have kindly contributed to the foregoing information or assisted me in securing a complete collection of *Ariocarpus.*

The foregoing information is original in only a small part, but is more of a summation of all the information I could find on this most interesting and little known group of plants. I will welcome any additional information or criticism of "mis-information."

EDITOR'S NOTE: The author of the above article modestly confesses that she is an amateur, but her work and study with one genus shows how interesting and valuable her efforts may be to other students. This contribution should inspire others to share their own investigations with Society Members. S. E. H.

*See illustration on page 76.

Orchids and Cacti

By W. G. BROOKS

Open air culture for orchids in the milder winter sections of the United States is not only a dream, but is an actual possibility. Many beautiful varieties of epiphytal orchids grow under such conditions that they will adapt themselves to weather conditions of Southern California and like sections of the United States. Some varieties such as the Mexican *Laelias* grow upon

the Mexican plateau and experience very sharp falls of temperature throughout the dry winter season and these plants would find here a warmer but wetter winter than in their high home. Some of the South American *Odontoglossums* grow upon the higher sections of the Andean uplift where only a stone's throw away lay the snow line that even in tropical regions promise very cold days throughout the year.

Because commercial growers have spent much time and money to cutlivate the orchids and to produce many beautiful and showy hybrids, it has been their policy to hold their knowledge of these plants among their own members and the layman at large has assumed that orchids could only be grown where heat and humidity are high. Having heard from so many adventurers that orchids only grow in the tepid, fever infested swamps of the tropical belt, the average man thinks of them as a luxury only for those with time and money to follow a hobby which is costly and problematical as to results.

This is not true. These most misunderstood plants offer to the average man greater possibilities in cultural success than he has ever dreamed possible. Before one can believe this, a little knowledge of orchids is necessary. When fully understood both as to plant and environment it is logical to suppose that orchids will make great strides towards becoming one of America's most prized flowers.

Orchids are divided naturally into two groups, epiphytal and terrestrial. The former class finds substance and moisture by perching upon the boughs of trees and sending forth aerial roots to gather food and moisture. The other, as the name implies, grows in the soil where conditions are to its liking. To the culturist, the epiphytes offer the most interest. These plants as a general rule are tropical and logically so due to the fact that the dense growth of the jungles cut off light and air from the lower levels and such plants needing both had to take to the air to afford themselves these conditions. Therefore the grower who would succeed needs to acquaint himself with these habitat conditions and try to give his orchids similar conditions in cultivation.

In California many plant fanciers have cultivated succulents and cacti with great success, little dreaming that the same temperatures would permit orchids to grow to a fair degree of perfection. Some succulents will not stand the falls in temperature that many orchids need. In Mexico some forms of the *Laelias* grow where many of the Californian grown succulents and cacti could not endure.

Most of our *Epiphyllums* and Christmas cactus are forms which have either come directly from the tropics or have been grown from tropical parents. These beautiful cacti are playmates to the orchids. Both are epiphytes by nature and grow upon the same trees together. By constant effort many of the *Epiphyllums* have been so acclimated that they seem as hardy as many other plants. As a matter of fact their water content is higher than many of the orchid neighbors of the rain forest sections of South America and it seems very possibly that the orchids are as adaptable as *Epiphyllums*.

Many cactus growers have learned that many types in the cactus family need almost the same conditions and care as the orchids and have broadened their interests to include them in their collections. Mr. Herbert J. Solomon of Sydney, Australia, who has collected succulents for years, has over 1,000 bulbs of *Cymbidiums*. Mr. Irving Levi of New York City possesses a fine collection of orchids and cacti. Other Cactus Society members having orchid collections are Capt. Harry E. Hurst of Puera Plata, Mr. J. Frank Parks of Dallas, Texas, Mr. Howard L. Hanes of Pasadena, Mr. Wm. Taylor Marshall, and Mr. J. W. Banks of Los Angeles and many others.

Many ferns, bignonias, begonias, bilbergias and cacti grow in the wilds with the orchids. Those of you who have successfully grown cacti will find additional pleasure and even profit by keeping abreast of the times and preparing yourselves to cultivate these many natural friends of your cacti. It only takes a little imagination to visualize a small glass house wherein these beautiful plants are growing and blooming together. Many growers have already done so and can boast of equal success with orchids which were thought to be beyond the average growers ability to care for or to possess.

Let us drift away to a not distant country where we may see in our mind's eye many beautiful orchids growing happily and casting their vivid colors about in the shaded avenues of the tropical forest or to the sunny hillsides of an elevated mountain side where in small and stunted oaks we may count many thousands of beautiful orchid colored flowers. No farther away than Mexico can we find this. We find beautiful *Laelia anceps* with emaculate leaves and pseudobulbs growing on the limbs of trees which shade the coffee bushes beneath The *Hylo-*

cereus undatus may be growing in the next limb or the white flower *Epiphyllum oxypetallum* which has outgrown its connection with the ground and has settled down to rest on the limb along side the orchids and bromelias. Such a beautiful setting! Or out in the picturesque state of Michoacan where the *Laelia majalis* grows in a high beautiful country overflowing opal-like lakes we may linger a moment to wonder at the gorgeous flowers so unproportionately large for the size of the plants from which they spring. In the fall we will see the myriad blossoms of the *Laelia autumnalis* growing on these same trees with the lovely *L. majalis* as a neighbor. Their home is dry even in winter and the Mexican government will tell you that along the line of travel below the hillside home of these beauties at the lake-shore village of Patzcuaro the temperature often reaches 26° F. Is there little wonder that we may suppose them to be fitted for outdoor culture in California?

Below the village of Taxco in the State of Guerrero blooms an orchid with pretty colored flowers worthy of any one's attention and alongside it on the limbs of a willow-like tree are many *Mammillarias** in appearance like the *M. pseudoperbella* and on the cliffs near by will be found the pretty shoots of *Lemaireocereus beneckei.* Again we ask is there any reason why we may not expect orchids and cactus to grow together in our gardens if they find the same environment in nature to suit their common desires? And this is not what you suppose to be a tropical jungle. Far from it. More like a desert, yet neither. Throughout this plateau country and down into the canyons of the mountain sides which hem in the dry, hot valleys will be found many types of orchids which offer floral tributes to those who care to avail themselves of them. Many of these plants will fit themselves into your garden with ease and comfort.

In this Mexican group are many outstanding varieties which deserve the attention of the culturist. Many *Odontoglossums, Oncidiums, Epidendrums* and *Sobralias* not to mention a host of other orchids may be found throughout the republic. Both epiphytic and terrestrial offer to the enthusiast a never ending array of color and variety.

And this is only the beginning. As we travel down the backbone of the mountain ranges of Central American and look to either side we also find many interesting forms of orchids and cacti growing on the same rocks and trees together. Here we may hesitate to gather the most promising ones and if we are prepared at home to care for them we may make a huge collection of gorgeous forms which are more lovely than can be described.

There is no denial that the queen of them all is the *Cattleya,* that regal beauty which defies description. And such a variety of forms and colors! To cultivate the better *Cattleyas* one must be prepared to house them from the frosts of winter as they reach their perfection in the South American tropics. This does not mean that they grow only in the low dank and dismal river jungles where humidity is overpowering, but mainly at elevations where the air is pure and the precipitation heavy at certain times of the year. In fact many collectors say that only at elevations above the hot lowlands will you find the worth while *Cattleyas.*

The culture of orchids is still in its infancy and although there has been an interest in these plants for many years it is only recently that they have been cultivated in the open. A grower in the Hollywood hills reports that he has flowered orchids out of doors. A far more extensive interest will be in the majority of localities where glass house culture is necessary and when the plant world is correctly informed that all orchids are not expensive and that they may be grown as easily as succulents.

EDITOR'S NOTE: Mr. Brooks is a field man and has a mass of first hand collecting information and flowering orchids to prove his statements. When he collects he lives with the plants and thus knows their habitat. Mr. Brooks will be glad to answer questions through these columns or direct by writing him at 1151 Acacia, Inglewood, Calif.

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*When the editor expressed amazement and possibly some doubt on the accuracy of this statement, I was able to assure him that I had seen the *Mammillarias* mentioned and they clearly showed their epiphytic origin. I have also observed seedling plants of *Rathbunia alamosensis* growing as epiphytes in Sonora, Mexico, and a *Harrisia nashii* epiphytic on *Lemaireocereus hystrix* near Monte Cristi in the Dominican Republic.

Doubtless seeds were dropped by birds or blown into leaf mould deposits in axils of tree branches and then germinated. The leaf mould was sufficient to nourish the seedlings to maturity. W. T. M.

The following is a timely proof of the interest in orchids and cactus growers may well consider the value of such exhibits.

SAN FRANCISCO FAIR WILL DISPLAY WORLD'S FINEST ORCHIDS IN 1939

By HENRIETTE HORAK

"Orchids for madame"—a palace full of them—will be exhibited on Treasure Island, at the Golden Gate International Exposition of 1939. Orchid growers from all parts of the world will bring their rare and precious blossoms to the "Orchid Palace," which

will house these exotic aristocrats of all flowers.

Queen of the exhibit will be the white orchid, the costliest of the orchid family. From the snow-line of the Peruvian Andes will come the dainty spray orchid; from mysterious Burma, India, the challenging "Cymbidium;" from the romantic Philippines, the demure "Butterfly" orchid; from age-old Malay Peninsula, the only blue orchid in the world.

The costliest orchid at the exhibit will be a plant from the original "Cattleya," Mrs. Butterworth's orchid, valued at $10,000. Scores of other varieties, including the pale apricot, and green-and-copper specimens, and ranging in price from $1.00 to $10,000 for individual orchids, will be exhibited.

An attempt will be made to display an orchid seed pod; one of these pods contains 80,000 seeds, which are so small that powerful magnifying glasses will be used to enlarge them for the eye to see. Visitors to the "Orchid Palace" will also have an opportunity to watch the process of orchid growing by the seedling method. A series of experiments with this method will be initiated, and orchid lovers will be able to watch the growth of the plants through various stages.

One of the purposes of the exhibit will be to demonstrate that orchid growing may be practiced as a home hobby. While the culture of orchids is not quite so simple as that of the more common garden flowers anyone with a heated greenhouse and some basic knowledge can be successful with tropical orchids.

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